

WHAT IS CLAIMED IS:

1. A process for fabricating a semiconductor device having a buried layer comprising the steps of:

implanting an impurity ion into where the buried layer to be formed in a substrate;

providing the substrate inside a reactor furnace;

preparing a nonoxidizing atmosphere inside of the reactor furnace;

annealing the substrate to activate and diffuse the implanted impurity ion region while increasing inside temperature of the reactor furnace up to a first temperature; and

shifting the inside temperature of the reactor furnace from the first temperature to a second temperature in which a epitaxial crystal starts to grow and introducing a epitaxial growth gas into the reactor furnace to grow an epitaxial layer on a surface of the substrate.

2. The process for fabricating the semiconductor device as set forth in claim 1, wherein the step of growing the epitaxial layer is initiated before the expanded ion implanted region reaches the surface of the substrate.

3. The process for fabricating the semiconductor device as set forth in claim 1, wherein the first temperature is lower than the second temperature.

Subt. B2

1 4. The process for fabricating the semiconductor device as set
2 forth in claim 1 further comprising the step of:
3 preparing a cleaning gas in the reactor furnace to clean up the
4 surface of the substrate between the step of diffusing the ion
5 implanted region and the step of growing the epitaxial layer.

1 5. The process for fabricating the semiconductor device as set
2 forth in claim 4, wherein the first temperature is lower than the
3 second temperature.

1 6. The process for fabricating the semiconductor device as set
2 forth in claim 4, wherein the first temperature is higher than the
3 second temperature.

1 7. The process for fabricating the semiconductor device as set
2 forth in claim 1, wherein the surface of the substrate is covered by
3 oxide film at the step of implanting the impurity ion.

Subt. B3

1 8. The process for fabricating the semiconductor device as set
2 forth in claim 4, wherein the cleaning gas is consist of H_2 gas.

1 9. The process for fabricating the semiconductor device as set
2 forth in claim 4, wherein the cleaning gas includes HCl gas.